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Karin Clavel
TU Delft Library

Thecla Ettema
TU Delft Library

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TUlib: Interactive Learning and Discovery of Information Literacy Skills using Web 2.0 Features

Karin Clavel, Thecla Ettema
TU Delft Library, the Netherlands
Extended Services
c.l.clavel@tudelft.nl, t.i.m.ettema@tudelft.nl

Abstract: TUlib is TU Delft's new online information literacy website. Its main features are a tag cloud search to allow easy navigation through the website, a modular design, interactive tutorials and the use of social bookmarking. The tag cloud is based on a custom thesaurus and is powered by the Collexis search engine. Tag cloud searches are being used in many of the popular web 2.0 web services, such as Flickr and YouTube. They seem to work well for this website, giving a good overview of what the information literacy website has to offer. During the development process, a lot of effort was put into getting future users involved. For this, questionnaires, surveys, a prize contest and concept testing were used. The website is still under construction, but has received positive response from both the student and teachers' communities.

Keywords: Information Literacy, Online Tutorials, Tagging

1. Introduction

TU Delft Library has always been active in information literacy education, both in-class and online. The current information literacy website, DelftSpecial, was launched in 2003. Although it is still used - about 1600 page loads per month - DelftSpecial was failing in two major aspects: 1) a usability test showed that students were put off by the strict hierarchy, which they found difficult to navigate and by the long paragraphs with too much detail; 2) because of the high maintenance costs, the website was not regularly updated, which made it obsolete very quickly.

TUlib was developed to overcome these issues. Its modular design and lack of hierarchy makes it easy to add, edit or remove topics and subjects. Students do not have to use a menu to navigate through the website, but can simply click on relevant concept tags or type in a search term.

This paper will explain the main features of TUlib and will also give a glimpse behind the scenes, to share some of the ways in which we got users and librarians involved in the development process.

2. TUlib: How to Find and Use Scientific Information

TUlib is TU Delft's new online information literacy website. It is accessible for anyone who is interested on <http://tulib.library.tudelft.nl>, but is mainly intended for use by TU bachelor and master students. In this section, the main features of TUlib will be discussed: the tag cloud based navigation, the modular structure, the use of interactive flash movies and the use of social bookmarking for presenting external resources.

2.1 Tag Cloud Search

The homepage does not have a "Welcome to..." or "Information About" section. Its main focus is a tag cloud which "flies" into view with the most important concepts as clickable tags. The tag cloud can also be used in combination with a search box (Figure 1). Once a query is entered, either by choosing a tag or by using the search box, a new tag cloud is generated, based on the indexed content of the website. In this dynamically generated tag cloud, tags are represented in big or small fonts and in normal or bold typeface, depending on how relevant the tag is in combination with the first query. Choosing another tag will refine your search, as both tags are combined in a new query. Searching by clicking tag clouds is made popular by well-known web 2.0 services, such as Flickr, YouTube, LibraryThing, del.icio.us, Technorati and last.fm.

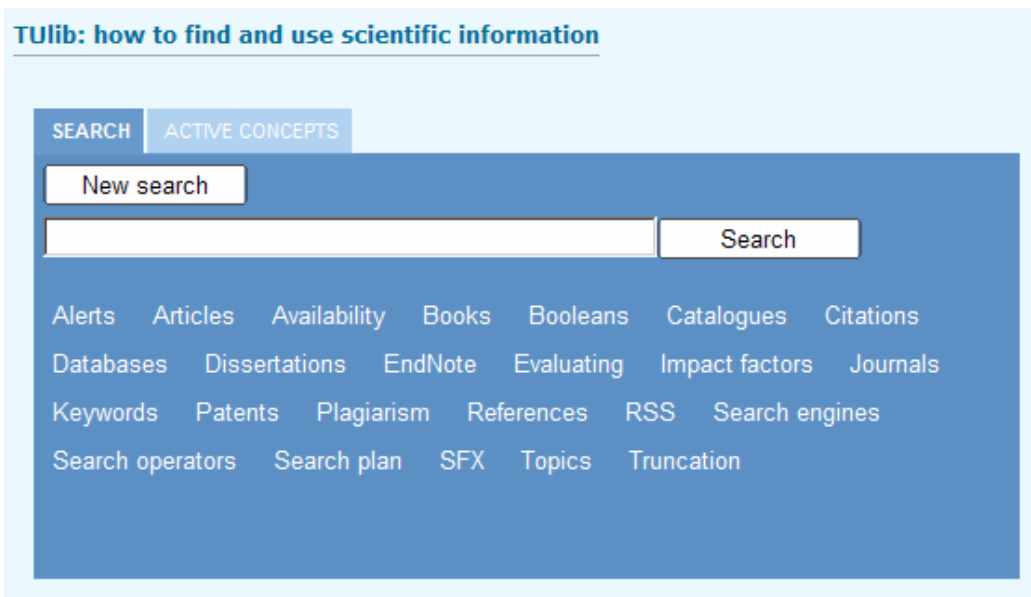


Figure 1: TULib's tag cloud

The tags are actually terms from a custom thesaurus. This custom thesaurus was based on a list generated by the underlying Collexis search engine: the search engine analyzed the newly written content as well as the content from our current information literacy website, "DelftSpecial". The resulting preliminary list of terms was then manually enhanced by a team of information specialists. In the future, analysis of the use of both tags and search terms will provide input for optimizing the thesaurus. Also, experimenting with user generated tags will be considered. The search engine indexes content both in thesaurus terms and full-text.

The tag cloud search makes it possible to keep the website as "unstructured" as possible. As the Collexis search engine will find the information students are looking for in one or at most two clicks, there is no need for a clear menu structure. This is important, because a usability study showed that our students did not understand the hierarchy in similar information literacy content as imposed by our information specialists and this made it difficult for them to navigate [Attema, 2003].

The other important reason for using the tag cloud is that it gives students a direct and comprehensive overview of what they can expect to find on the website, without even having to click once.

The tag cloud search was adapted by Collexis from their standard product. Before TULib, Collexis had not considered the use of a tag cloud without first typing and executing a query. Based on the good results in TULib, Collexis is now offering this solution to other customers as well.

2.2 Flexible Modules

The website is modular in design. This makes it easy to add, adapt or remove modules without affecting the entire website. The modular design makes it easy to link to specific topics from either the Library website, as a help function, or from a course on the university's course management system.

To keep maintenance manageable, internal links from one module to another, are only allowed in the "See also" section on the right-hand side of the modules' web page.

2.3 Interactivity

Our current students are part of what is often called the Net Generation. The Net Generation prefers active learning or learning by discovery, is more visually oriented and dislikes being taught by lectures [Branston, 2006; Doshi, 2006]. With interactive online instruction you do not only offer information, but also a learning experience [Dewald, Scholz-Crane, Booth, & Levine, 2000].

TUlib has two ways of providing interactive content. Firstly, there are the interactive tutorials which were created in-house using Adobe Captivate. These tutorials explain for example how a tool works or how to make a search plan or a concept map. Instead of just making a movie, we used Siegel's [2006] approach and created hybrid projects with both demonstration and assessment aspects. Students can follow the instruction but must initiate certain steps to continue (Figure 2).

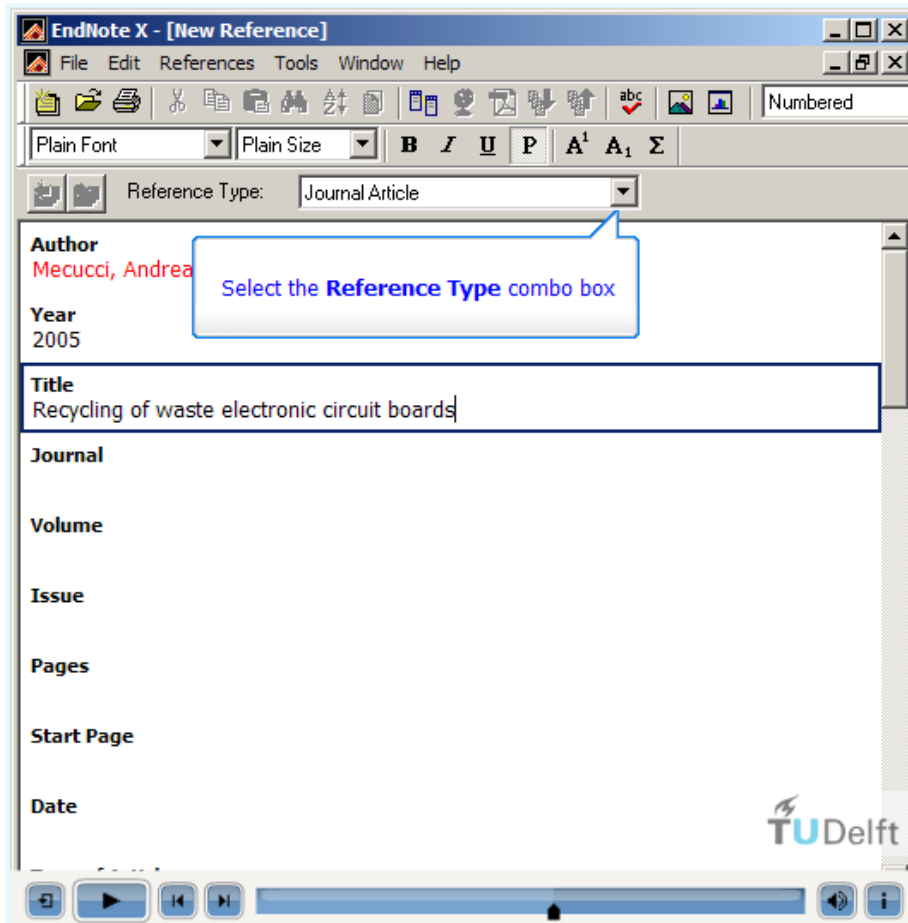


Figure 2: Interactive TUlib tutorial about adding new references in EndNote

Secondly, every TUlib module comes with a set of assessment questions in a question pool from which custom online assessment tests can be generated in the TU Delft's own Etude's system [TU Delft, 2007]. A demonstration test is available to show to teachers. Custom tests with random questions from different subject areas can be easily and quickly created using the Etude software.

2.4 Social Bookmarking with Del.icio.us

To encourage students to read beyond our own website, the module pages contain a section with interesting external links. Del.icio.us social bookmarking is used to generate a tag cloud for each module. For example, clicking on the "mindmapping" tag in the "Making a search plan" module, takes the user to a list del.icio.us with links to both articles about mindmapping and mindmapping software. Using social bookmarking means that the whole team of information specialists or librarians can add or edit these links, maintaining them in one location only.

3. The Making of TULib

In this section the process of designing and developing TULib will be explained. The project was first discussed in March 2006, but the project plan was not ready until early 2007. In the meantime, a preliminary study was carried out. The TULib website was unofficially launched on October 7th 2007. Not all modules are finished yet, currently (March) we have 6 working modules and there are two new modules under construction.

3.1 Preliminary Study

Firstly, a preliminary study was carried out resulting in a report on what and what **not** to make and which tools and techniques to use. Part of this report are lessons learned from the past, results of an online survey, a literature study and good and bad ideas from online library instructions from universities around the world [Nagel, Clavel, & van Wezenbeek, 2007].

Based on this report, a project plan was made and a project team formed. The team consisted of two product researchers (one of which was the project manager), four information specialists who are involved in literacy education and an account manager as a representative of the customers.

3.2 Getting Students and Teachers Involved

One of the obstacles was getting students and teachers involved in an early stage in order to maximize constructive user input into the design of the website. In the first stage of the project this was done by putting an online survey on our website(s) asking library users to tell us which subjects were of interest to them. The results were somewhat surprising. Libraries tend to put much effort in teaching users how to search (e.g. their catalog, bibliographic databases, www). Users do not think they need much help with that. A study by ProQuest confirms this: students have no difficulty using electronic resources [Law, 2007], despite the fact that user interfaces and search options can differ greatly among systems. Instead, our users wanted information about using tools such as EndNote, about where to find relevant information sources and how to get started on a literature study. These results were used to determine which modules were to be developed and also which were to be developed first.

Secondly, once a concept design was ready, it was tested in two small groups, each consisting of 3 students and a teacher. They evaluated the concept website by doing some exercises, filling out a questionnaire and then discussing the results as a group. This provided valuable input for some design changes.

Thirdly, a prize contest was set out among students and teachers to come up with a new name for the new online instruction tool. From over 120 contributions, a jury consisting of students and a teacher selected "TULib". Two students won an Apple iPod.

Lastly, the tag cloud search was evaluated using an online survey with several testing tasks and questions. Students and teachers found the tag cloud useful (70% out of 20 respondents) and they liked to use it (65%). Most users (85%) succeeded in completing the tasks finding specific information.

Getting the users involved in the design and development was both useful and inspiring. It was difficult getting enough testers, especially among students and we needed incentives like iPods and book tokens to get them to cooperate.

3.3 Creating Content during Workshops

Because we wanted our content to be web-readable to the Net Generation, special attention was required for generating content. Instead of simply letting the information specialists write the text, we organized several workshops. In a workshop, pairs of information specialists worked together to set up the text and scenarios for the interactive movies. They then presented their work to the group for peer review. This sometimes initiated lively discussions about what is really important. We could then put the essentials down in short sentences and lists, simplifying concepts and sometimes compromising on completeness in the "Getting started" sections. More advanced subjects were put under a second tab named "Learn more...".

4. Conclusion

TUlib has been demonstrated to the Board of the University Corporate Office, the Faculty Student Council and to teachers and the Director of Education of the Faculty of Architecture. The website and especially the tag cloud was presented and demonstrated as a Collexis case study at the Internet Librarian International 2007 conference in London.

So far, everyone has responded with great enthusiasm. But, as the website is not finished yet, it is too early to evaluate. We hope to evaluate both its use and usability in the second half of 2008.

The development process has been a valuable experience and a lot of fun as well. We hope many students will benefit from TUlib and get inspired to find better quality information for their research and do so more effectively.

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